INDEX TO VOLUME XXXIX.*

A

Academy, Kansas, transactions, 413. National, Washington meeting, 412; memoirs of, 414.
Algol system, Vogel, 245.
Astronomical Observatory, Yale, transactions, Hall, 245.

B

Barbour, E. H., Iowa meteorites, 521.
Barker, G. F., chemical notices, 65, 147, 230, 312, 397, 518.
Barus, C., absolute viscosity of solids, liquids and gases, 234; fluid volume and its relation to pressure and temperature, 478.
Baumhauer, H., Das Reich der Krystalle, 75.
Baur, G., Kadaliosaurus priscus, 156.
Bayley, W. S., rocks of Pigeon Point, 273.
Becker, G. F., Quicksilver deposits of Pacific slope, 68; proof of the earth's rigidity, 336.
Beecher, C. E., development of some Silurian Brachiopoda, 71.
Bibliographie de l'Astronomie, Houzeau and Lancaster, 411.
Bibliotheca Zoölogica, II, 163.
Bishop, I. P., Lower Silurian fossils in Columbia Co., N. Y., 69.
Blake, W. P., mineralogical notes, 43.
Bolometer, Helmholtz, 154.
Bolton, H. C., sonorous sand of Sinai, 151.
Botanical Works noticed—
Botany of the Northern United States, Gray, 240.
Die natürlichen Pflanzenfamilien, Engler und Prantl, 75.
Garnsey's Translation of Sachs's History of Botany, 407.
West American Oaks, Kellogg, 79.
Memoirs of Torrey Botanical Club, vol. I, No. 1, 162.
Prodromus Faunæ Mediterraneæ, etc., congessit, Carus, 410.
Botany—
Diatom beds of the Yellowstone Park, Weed, 321.
Histology as basis for classification, 407.
Hybrids, Saporta, 161.
Iodes Tomentilla, stem structure, Robinson, 407.
Nitrogen, fixation of by leguminous plants, Bréal, 163.
Botany—
Nutrition of higher plants, part ammonia plays in, Müntz, 162.
Ranunculus, hybrids in, 325.
Sap, cause of ascent of, Boehm, 162.
Saprophytes, roots, Johow, 243.
Temperature-experiments on relations of plants to cold, 78.
Tropical plants, effects from a temperature of 30° to 40° F., 77.
Woody tissues, disintegration of, 79.
See further under Geology.
Brainerd, E., Calciferous formation in the Champlain Valley, 235.
British Fossil Vertebrata, catalogue, Woodward and Sherborn, 402.
Branner, J. C., æolian sandstones of Fernando de Noronha, 247.
Brinton, D. G., Essays of an Americanist, 413.
Browning, P. E., determination of iodine in haloid salts, 188.
Brush, G. J., minerals at Branchville, Ct., 201.

C

Canfield, F. A., catalogue of minerals of N. Jersey, 161.
Carus, J. V., Prodromus Faunæ Mediterraneæ, etc., 410.
Cascade mountains, ascent of peak in, Röll, 80.
Cavendish experiment, Boys, 154.
Challenger, magnetic results of voyage, 154.
Chemistry, Dictionary of applied, 519.
Chemistry—
Aluminum chlorides, vapor-density, 313.
Ammonia, emission-spectrum, Magnanini, 518.
Barium cobaltite, Rousseau, 232.
Carbon disulphide, decomposition of by shock, Thorpe, 65.
Cerebrose, identity with galactose, Thierfelder, 316.
Chlorine, determination in mixtures of alkaline chlorides and iodides, Gooch and Mar, 293.
Dextrose, constitution, Skraup, 233.
Fluorine, density, 397.
Gold, atomic mass, Mallet, 399.
Hydrogen arsenide and hydrogen antimonide, Brunn, 398.
Iodine, in haloid salts, Gooch and Browning, 188.

*This Index contains the general heads Botany, Chemistry, Geology, Minerals, Obituary, Rocks, Zoology, and under each the titles of Articles referring thereto are mentioned.

Metals, lowering of freezing point, Heycock and Neville, 230.
Nitrosyl chloride, emission-spectrum, Magnanini, 518.
Oxygen, dissolved in water, Thresh, 398.
Periodic law, Mendeléeff, 147.
Platinic fluoride, preparation, Moissan, 315.
Potassium and sodium, combination with ammonia, Joannis, 315.
Selenium chlorides, Chabrie, 231.
Silver silicate, formation, Hawkins, 311.
Sodium carbonate, made by electrolysis, 232.
Solutions, nature of, Pickering, 397.
Vapor-density, below boiling point, Demuth and Meyer, 312.
Xylose or wood-sugar, Wheeler and Tollens, 315.
Clarke, J. M., development of some Silurian Brachiopoda, 71; the Hercynian question, 155; compound eyes of arthropoda, 409.
Convection, electromagnetic effect of, Himstedt, 153.
Cook, C. S., mountain study of the spectrum of aqueous vapor, 258.
Corals and Coral Islands, J. D. Dana, 326, 410.
Cornish. Archæan rocks about Norfolk, Ct., 321; glacial scratches, 321.
Cramer, F., recent rock flexures, 220.
Cross, W., secondary minerals of amphibole and pyroxene groups, 359.

D

Dana, E. S., barium sulphate from Perkin's Mill, 61; minerals of Branchville, Ct., 201; tyrolite from Utah, 271.
Dana, J. D., Sedgwick and Murchison, Cambrian and Silurian, 167, 237; work on Characteristics of Volanoes, with facts from the Hawaiian Islands, 323; Archæan axes of eastern N. America, 378; red color of some sandstones, 318; Corals and Coral Islands, of, noticed, 326, 410.
Darton, N. H., basalt dikes in central Appalachian Virginia, 269.
Davis, W. M., geographic development of northern N. Jersey, 404; trap sheets of Connecticut Valley, 404.
Dawson, G. M., Cretaceous of British Columbia, Nanaimo group, 180.
Dawson, J. W., notice of "Fauna der Gaskohle," etc., 405; fossil plants from Mackenzie and Bow Rivers, 406.
Depths, see Ocean.
Diller, J. S., gold in calcite, 160; basalt of central Appalachian Virginia, 269.
Dust in the atmosphere, Aitkin, 316.
Dwight, W. B., fossils of Dutchess Co., N. Y., 71.

E

Eakins, L. G., new stone meteorite, 59: meteoric iron from N. Carolina, 395.
Earth's rigidity, proof of, Becker, 336.
Eaton, D. C., notice of Gray's Manual, 240.
Electricity, absolute measurements in, Gray, 235.
in Modern Life, de Tunzelmann, 401.
Elementary Lessons in, Thompson, 235.
Electric oscillatory discharge, 519.
potential, measured by work, Mayer, 334.
undulations, Sarrasin and De la Rive, 233.
vibrations, in rarefied air without electrodes, Moses, 400.
Electrometer, pendulum, experiments with, Mayer, 327.
spring-balance, Mayer, 513.
Energy, radiant, of standard candle, Hutchins, 392.
Engler, A., Die natürlichen Pflanzenfamilien, 75.
Evolution, divergent, and the Darwinian theory, Gulick, 21.
of the Arietidæ, Hyatt, 243.

F

Ferrel, W., Weber's law of thermal radiation, 137.
Fœrste, A. F., Cambrian from Nahant, Mass., 71.
Fontaine, W. M., Potomac Flora, 520.
Fossil, see GEOLOGY.
Fritsch, A., Fauna der Gaskohle, etc., 405.

G

Ganong, W. F., economic Mollusca of New Bruswick, 163.
Gas, rock pressure on natural, in Ohio, Orton, 225.
Gas volumes, determination of, Lunge, 396.
Gems and Precious stones of N. A., Kunz, 521.
Genth, F. A., contributions to mineralogy, No. 46, 47; Jarosite from Utah, 73; Lansfordite, Nesquehonite, 121.
Geodesy, Bibliography of, Gore, 80.
Geological Society of America, 158, 402.
Geological Record for 1880–1884, 324.
GEOLOGICAL REPORTS AND SURVEYS—
Canada, 1887–88, Selwyn, 238.
Minnesota, 1888, N. H. Winchell, 67.

GEOLOGICAL REPORTS AND SURVEYS—
Missouri, 72, 520.
New York, 1888, Hall, 155.
Scandinavia, map of, 521.
U. S. Geol. Survey Bulletins, Nos. 45–53, 72.
Geologie de l'Ancienne Columbie Bolivarienne, etc., Karsten, 319.
Geologie der Münsterthals, Schmidt, 72.
Geology, Paleontology, Miller's American, 67.
GEOLOGY—
Archæan axes of eastern N. A., Dana, 378.
rocks of Norfolk, Ct., Cornish, 321.
rocks of Minnesota, Winchell, 67.
Anthrolycosa, antiqua of, Harger, 166.
Basalt dikes, in Appalachian Virginia, Darton, 269; Diller, 270.
Calciferous formation in the Champlain Valley, Brainerd and Seely, 235.
Cambrian and Silurian; Sedgwick and Murchison, J. D. Dana, 167, 237.
Cambrian, new fossils from Lower, Walcott, 159.
fossils from Nahant, Mass., Fœrste, 71.
of Province of Quebec, Ells, Walcott, 101.
tracks in the Animikie, beds, Selwyn, Matthew, 145.
in Salt Range, India, Warth, 159.
Carbonic and other gaseous emanations at Death Gulch, Weed, 320.
Carboniferous limestone, etc., in British Columbia, 238.
series in central Texas, Tarr, 404.
formation in S. E. England, Boyd-Dawkins, 401.
Ceratopsidæ, additional characters of, with notice of new Cretaceous Dinosaurs, Marsh, 418.
Cretaceous of British Columbia, Dawson, 180.
of Kansas, bird track from, 166.
of New Mexico, Lower, White, 70.
of South America, north part, Karsten, 319.
of Texas, invertebrate fossils, Hill, 521.
Dinosaurs, Marsh, 81, 418.
Plants from Martha's Vineyard, D. White, 93.
Devonian plants from Ohio, Newberry, 71.
system of Devonshire, H. S. Williams, 31.
Diatom beds and bogs of the Yellowstone Park, Weed, 321.
Dinosaurian reptiles, new, description, Marsh, 81.
Faults, normal, origin, Reade, 51.
Flexure, in rocks, recent, Cramer, 220.
GEOLOGY—
Glacial scratches near Norfolk, Ct., Cornish, 321.
Hallopoda, distinctive characters of the order, Marsh, 415.
Lingula with cast of peduncle, Walcott, 159.
Metamorphic strata of S. E. New York, Merrill, 383.
Metamorphic rocks of California, etc., Becker, 68.
Palæontologie, work on, by Steinmann and Döderlein, 240.
Permian, Kadaliosaurus priscus of Credner, notice of, Baur, 156.
of Bohemia, Fritsch, notice of, by Dawson, 405.
Potomac flora, Fontaine, 520.
Quaternary history of Mono Valley, California, Russell, 402.
Mammals of Florida, etc., Leidy, 321.
Quicksilver Deposits of the Pacific slope, Becker, 68.
Red color of rocks, origin of, Russell, 317; Dana, 318.
Rivers in western N. S. Wales, water received by, 404.
Sandstones, æolian, of Fernando de Noronha, Branner, 247.
Silurian, Brachiopoda, Development of, Beecher and Clarke, 71.
Lower, fossils in Columbia Co., N. Y., Bishop, 69.
in Dutchess Co., N. Y., Dwight, 69.
sponges, in the Chazy, Dawson, 320.
of Province of Quebec, Ells, Walcott, 101.
Silurian, Upper. The Hercynian Question, J. M. Clarke, 155.
of Eastern Maine, Bailey, 239.
Taconic, relation to Cambrian, Dana, 168, note 171.
Tertiary, Mammals of Uinta formation, Scott and Osborn, 403.
Notice of new, Marsh, 523.
Butterflies of Florissant, Scudder, 414.
Plants from Mackenzie and Bow Rivers, Dawson, 406.
Triassic trap, sheets of Connecticut valley, Davis, 404.
Vertebrate, fossil, of Great Britain, Catatogue of Woodward and Sherborn, 402.
Zinciferous clays of Missouri, Seamon, 38.
Gooch, F. A., determination of iodine in haloid salts, 188; of chlorine in mixtures of alkaline chlorides and iodides, 293.
Goodale, G. L., botanical notices, 75, 161, 243, 325, 407.

Gravitation, velocity of propagation, Van Hepperger, 400.
Gray, Andrew, Absolute measurements in Electricity and Magnetism, 235.
Gray. Asa, Manual of Botany, new edition, 240.
Groth, P., Tabellarische Uebersicht der Mineralien, 324.
Gulick, J. T., divergent evolution and Darwinian theory, 21.

H

Harker, A., Bala volcanic rocks, 406.
Hawkins, J. D., minium from Leadville, 42; formation of silver silicate, 311.
Heat, sun's, Ångström, 316.
Hidden, W. E., Polycrase in N. and S. Carolina, 302; Hamlinite, new mineral from Maine, 511.
Hilgard, E. W., concentration of some California saline lakes, 165.
Hill, R. T., check list of Cretaceous invertebrates of Texas, 521.
Hillebrand, W. F., tyrolite from Utah, 271.
Hutchins, C. C., radiant energy of the standard candle; mass of meteors, 392.
Hyatt, A., Genesis of the Arietidæ, 243.

I

Induction, neutralization of, Trowbridge and Sheldon, 17.
Interference experiment, Michelson, 216.

K

Karsten, H., Géologie de l'Ancienne Columbie Bolivarienne, etc, 319.
Kellogg, A., illustrations of West American Oaks; text by E. L. Greene, 79.
Kunz, G. K., Gems and Precious Stones of N. A., 521.

L

Laboratory, physical, magnetic field in, Willson, 87, 456.
Lane, A. C., estimation of the optical angle in parallel light, 53.
Leidy, J., mammalian remains of Florida, etc., 321.
Light and electricity, Righi, 66.
Light, mechanical equivalent, Tumlirz, 153.
Light-waves, measurement of, Michelson, 115.
Loomis, Elias, memorial address, Newton, 427; list of papers, Appendix.
Loubat prize of the French Institute, 413.
Lydekker, R., Manual of Palæontology, 239.

M

Mackintosh, J. B., polycrase in N. and S. Carolina, 302.
Magnetic field in Jefferson Physical Laboratory, Willson, 87, 456.
Magnetic results of the Challenger expd., 154.
Magnetism, diurnal variation in terrestrial, Schuster, 411.
Magnetization at different temperatures, Dubois, 400.
Mar, F. W., determination of chlorine in mixtures of alkaline chlorides and iodides, 293.
Marsh, O. C., new Dinosaurian reptiles, 81; distinctive characters of the order Hallopoda, 415; additional characters of the Ceratopsidæ, with notice of new Cretaceous Dinosaurs, 418; new Tertiary Mammals, 523.
Mayer, A. M., experiments with pendulum-electrometer, 327; electric potential measured by work, 334; spring-balance electrometer, 513.
Mercury, rotation of, Schiaparelli, 245.
Merrill F. J. H., metamorphic strata of S. E. New York, 383.
Meteor, May 2d, orbit, 522.
Meteoric iron from N. Carolina, Eakins, 395.
Meteorite, new stone, Eakins, 59.
Meteorites, fall in Iowa, May 2, 521.
Meteorological Society, American, 163.
Meteorology, dynamical, recent contributions to, Waldo, 280.
Meteors, mass of, Hutchins, 392.
Michelson, A. A., measurement by light-waves, 115; interference experiment, 216.
Miller, S. A., North American Geology and Paleontology, 67.
MINERALS—
Amphibole, secondary, 359; St. Lawrence Co., N. Y., 352. Andalusite, Patrick Co., Va., 48. Arsenic, native, Colorado, 161.
Barium sulphate, Templeton, Quebec, 61. Bournonite, Arizona, 45.
Calamine, origin in Missouri, 38. Calcite, pseudomorph after glauberite, 45. Celestite, Mineral Co., W. Virginia, 183. Chloritoid, Patrick Co., Va., 50. Cohenite, 74. Corundum, Patrick Co., Va, 47, 48. Cyanite, Patrick Co., Va., 49.
Dickinsonite, Branchville, Ct., 213.
Edisonite, 159. Epigenite, Sweden, 161.
Fairfieldite, Branchville, Conn., 212. Ferrostibian, Sweden, 160. Fillowite, Branchville, Conn., 215.
Glauberite, Verde Valley, Arizona, 44. Gold, native, in calcite, 160.

MINERALS—
Halite, Verde Valley, Arizona, 44. Hamlinite, 511. Hornblende, St. Lawrence Co., N. Y., 352. Hureaulite, Branchville, Ct., 207.
Janosite, 73.
Knoxvillite, 73.
Lansfordite, 121.
Margarite, Patrick Co., Va., 49. Messelite, 74. Michel-lévyte, 61. Minium, Leadville, 42. Mirabilite, Verde Valley, Arizona, 44. Muscovite, Patrick Co., Va., 49.
Napalite, Napa Co., Cal., 74. Natrophilite, Branchville, Ct., 205. Nesquehonite, 122.
Phenacite, new localities, 325. Pleurasite, Sweden, 161. Polycrase in N. and S. Carolina, 302. Pyroxene, secondary, 359.
Raphisiderite, 74. Reddingite, Branchville, Ct., 211. Redingtonite, Cal., 73. Rhætizite, Patrick Co., Va., 49. Rutile-Edisonite, 159.
Scapolite in rocks, N. J., 407. Spangolite, 370. Stibiatil, Sweden, 161.
Thenardite, Verde Valley, Arizona, 44. Tyrolite, Utah, 271.
Warrenite, 74. Wulfenite, Sing Sing, N. Y., 159. Wurtzilite, 160.
Mineralien, Tabellarische Uebersicht, Groth, 324.
Minerals of New Jersey, Canfield, 161.
Minerals, secondary of amphibole and pyroxene groups, Cross, 359.
Mirror, method of rotating, Oettingen, 317.
Musical Sand, Sinai, Bolton, 151.
tones by means of unlike formed waves, König, 399.

N

Newberry, J. S., Devonian plants from Ohio, 71; geological notice of Woodward's British Vertebrates, 402.
New Jersey, geographic development of northern, Davis and Wood, 404.
Newton, H. A., memorial address of Elias Loomis, 427; orbit of Iowa meteor, 522.
Nichols, E. L., electrical resistance of alloys of ferro-manganese and copper, 471.
Nicholson, H. A., Manual of Palæontology, 239.
Nitrification of Ammonia, Schlœsing, 162.

O

OBITUARY—
Ashburner, C. A., 166
Coffin, J. H. C, 246
Crane, John Huntington, 246.
Deslongchamps, Eugene E., 326.
Loomis, Elias, 427.
Lyman, Chester Smith, 245.
Neumayr, Melchior, 326.
Owen, Richard of Indiana, 414.
Perry, Stephen J., 246.
Quenstedt, F. von, 326.
Zepharovich, Victor Ritter von, 326.
Observatory, Yale, Transactions of, 245.
Ocean, depths of South Pacific, 412.
Optical angles, estimation, Lane, 53.
Orton, E., rock pressure of natural gas of Trenton Limestone of Ohio and Indiana, 225.
Osborn, H. F., Mammalia of the Uinta formation, 403.

P

Pacific Ocean, see Ocean.
Paläontologie, Elemente von Steinmann und Döderlein, 240.
Paleontology, Manual, Nicholson and Lydekker, 239.
Paleontology and Geology, American, Miller, 67.
Penfield, S. L., lansfordite, nesquehonite, new minerals, 121; Spangolite, new copper mineral, 370; Hamlinite, new mineral from Maine, 511.
Peruvian arc, measurement of, Preston, 1.
Photographic halos, suppression of, 520.
Photography, surface tension studied by, 519.
Pickering, E. C., spectrum of ζ Ursæ Majoris, 46.
Polarization, galvanic, Warburg, 66.
Preston, E. D., on the measurement of the Peruvian arc, 1.

R

Radiation, thermal, Weber's law, Ferrel, 137.
Reade, T. M., origin of normal faults, 51.
Resistance, of alloys of ferro-manganese and copper, Nichols, 471; measurements of, Feussner, 317.
Robinson, stem structure of Iodes Tomentilla, 407.
ROCKS—
Basalt of dikes in central Appalachian Virginia, Diller, 269.
Metamorphic origin of California Cretaceous, etc.
Scapolite-rock in N. J. Archæan, Nason, 407.
Soda-granite and quartz keratophyre of Pigeon Point, Bayley, 273.
Volcanic of the Bala series, of Caernarvonshire and associated rocks, Harker, 406.
Russell, I. C., subaerial decay of rocks and origin of red color of certain formations, 317; quaternary history of Mono Valley, Cal., 402.

S

Sand, sonorous, of Sinai, Bolton, 151.
Schmidt, A., Geologie des Münsterthals, 72.
Scandinavia, geological map, 521.
Schuster, A., diurnal variation of terrestrial magnetism, 411.
Scott, W. B., Mammalia of the Uinta formation, 403.
Seamon, W. H., zinciferous clays of southwest Missouri, 38.
Sedgwick and Murchison, Dana, 167, 235.
Seely, H. M., calciferous formation in the Champlain Valley, 235.
Selwyn, A. R. C., tracks in rocks of the Animikie group, 145.
Sheldon, S., neutralization of induction, 17.
South America, geology of northern, Karsten, 319.
Spectra of chemical elements, structure of, Rydberg, 400.
Spectrum of aqueous vapor, mountain study of, Cook, 258.
Spectrum of ζ Ursa Majoris, Pickering, 46.
Squinabol, S., contribuzioni alla Flora Fossile dei Terreni Terziarii della Liguria: I–II, 72.
Steinmann, G., Elemente der Paläontologie, 240.
Stoddard, J. T., improved wave apparatus, 218.

T

Tarr, R. S., topographic features of central Texas, 306; Lower Carboniferous limestone series in central Texas, 404.
Telescope and scale reading, simple modification of method, Dubois, 66.
Tension, superficial, studied by photography, 519.
Thermo-electricity, DeCoudres, 317.
Texas, central, topographic features of, Tarr, 306; Lower Carboniferous of, 404.
Thompson, S. P., Elementary Lessons in Electricity and Magnetism, 235.
Thorpe, T. E., Dictionary of Applied Chemistry, 519.
Torrey, J., Jr., Iowa meteorites, 521.
Trowbridge, J., neutralization of induction, 17; physical notices, 66, 153, 233, 316, 399, 519.
Tunzelmann, G. W. de, Electricity in Modern Life, 401.

V

Vibrations, experiments with Hertz's, G. F. Fitzgerald, 233.
Viscosity of solids, liquids, gases, Barus, 234.
Volcanic soils, Italian, Ricciardi, 404.
Volcanoes, Characteristics of with facts from the Hawaiian Islands, Dana, 323.

W

Walcott, C. D., review of Dr. R. W. Ells's Report on Geology of portion of Province of Quebec, 101; notice of N. Y. Report, including Clarke on the Hercynian Fauna, 155.
Waldo, F., recent contributions to dynamical meteorology, 280.
Ward, L. F., notice of a paper of fossil plants of British America, 520; of Fontaine's Potomac Flora, 520.
Wave-motion apparatus, Stoddard, 218.
Weed, W. H., Carbonic acid and other gaseous emanations of Death Gulch, 320; Diatom beds and bogs of Yellowstone Park, 321.
Wells, H. L., analyses of Branchville phosphates, 201.
White, D., Cretaceous plants from Martha's Vineyard, 93.
Whittle, C. L., trap sheets of Connecticut Valley, 404.
Willcox, J., identity of modern Fulgur perversus with Pliocene F. contrarius, Conrad, 352.
Williams, G. H., celestite from Mineral Co., W. Virginia, 183; hornblende of St. Lawrence Co., N. Y., 352.
Williams, H. S., Devonian system of Devonshire, 31.
Willson, R. W., magnetic field in Jefferson Physical Laboratory, 87, 456.
Winchell, N. H., Geological Survey of Minnesota, 1888, 67.
Wood, J. W., Jr., geographical development of northern New Jersey, 404.
Woodward, A. S., Catalogue of British fossil Vertebrata, 402.

Y

Yeates, W. S., new localities of phenacite, 325.

Z

Zoölogical bibliography, 163.
Zoölogy—
  Arthropoda, compound eyes of, Clarke, 409.
  Mollusca, economic of New Brunswick, Ganong, 163.
  See further under Geology.